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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/572,714

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EXAMINER

SHAH, TANMAY K

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/572,714	Applicant(s) MCNEELY, DAVID LOWELL	
	Examiner TANMAY K. SHAH	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 and 22 is/are allowed.
- 6) ☒ Claim(s) 1,3,5 - 9, 11, 13 - 17 and 19 - 20 is/are rejected.
- 7) ☒ Claim(s) 2,4,10,12 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to the Amendment to application 10/572,714 filed 4/29/10.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 9 and 17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raphaeli (**US 6,466,613**) in further view of Shiraishi (**US 6,975,691**).

Regarding claim 1, A digital radio frequency (RF) transceiver circuit, comprising:

a converter circuit that samples a receiver input signal (**i.e. A/D, 72 of Fig. 3, as known in the art the A/D converter samples the input signal**);

Circuitry (**i.e. switch, Fig. 2**) that is adapted to select between a transmitter input signal and the sampled receiver input signal (**i.e. a switching device, such as an analog switch, performs the switching function of connecting the filter either to the output of the transmitter during**

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transmission or connecting the filter to the output of the communications medium interface during reception. During transmission, an output amplifier functions to amplify the output of the filter before the communication medium interface couples the signal onto the medium. During reception, the output amplifier is disabled and the signal received from the communications medium interface is filtered and then input to the receiver, col 2, line 38 - 47);

a filter (i.e. **Tx/Rx filter, 40 of Fig. 2**), the filter being adapted to receive both the transmitter input signal and the sampled receiver input signal (i.e. **as shown in Fig. 2, the filter receives both transmitter and receiver signal**), the filter circuit adapted to produce either a filtered transmitter signal or a filtered receiver signal (i.e. **if the filter is in transmitter mode it filters the transmitter signal and if the filter is in receiver mode it filters the received signal**); and

circuitry that alternatively receives the filtered transmitter signal or the filtered receiver signal and produces a modulated output and a demodulated output (i.e. **the transmitter adapted to encode and modulate a transmit signal in accordance with transmit data to be transmitted, a receiver coupled to the host interface, the receiver adapted to decode and demodulate signals received from the communications medium interface so as to yield receive data, col 2, line 55 - 62**). However does not specifically disclose that the filter sampling frequency is lower than the converter sampling frequency.

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Shiraishi teaches filter operating frequency at a sampling frequency is lower than the sampling frequency of the converter and the circuitry that produces modulated output (**the digital filters 64 and 65 at a half of the sampling rate of the A/D converters 62 and 63 to output I and Q baseband signals (I and Q symbol stream data) of two series representative of instantaneous values of symbols of the I- and Q-axes, BPSK, QPSK is all modulation types, col 2, line 26 - 30**).

It would have been an obvious matter of design choice to one skilled in the art at the time the invention was made to use sampling rate in filter less than A/D converter provided by the inventor since applicant has not disclosed that this solves any stated problem or is anything more than hardware choice. A person of ordinary skill in the art would find obvious for the purpose of sampling. In re Dailey and Eilers, 149 USPQ 47 (1966) see MPEP 2144.04.

Regarding claim 9, the transceiver has substantially same limitations as claim 1, thus the same rejection is applicable.

Regarding claim 17, the transceiver has substantially same limitations as claim 1, thus the same rejection is applicable.

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5. Claim 3, 8, 11, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raphaeli (**US 6,466,613**) in further view of Shiraishi (**US 6,975,691**) in further view of Beck (**US 2002/01091825**).

Regarding claim 3, Raphaeli with Shiraishi teaches claim 1, however does not teach filters are FIR filters.

Beck teaches wherein the plurality of filters comprises finite impulse response (FIR) filters (**i.e. FIR filter, 511 of Fig. 5**).

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Raphaeli with Beck. One would be motivated to combine these teachings because they do not cause phase distortion or delay distortion.

Regarding claim 8, Raphaeli and Shiraishi teaches claim 1, however does not disclose delay chain in detail.

Beck teaches wherein the receiver input signal is processed with a delay line having a plurality of output delays (**i.e. Fig. 2, N-1 delay elements 201, including delay elements 201-2 through 201-N, page, paragraph 30**), each of the output delays corresponding to one of the plurality of filters (**i.e. output is from delay tap of filters, page 3, paragraph 30**) and wherein each of the plurality of filters has a different delay characteristic that compensates the associated output delay (**i.e. Each symbol of the baseband demodulated received training signal is initially supplied to the first delay element, delay**

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element 201-2, as well as to the first multiplier, multiplier 203-1. For each clock cycle the symbol stored in each delay element is supplied to the next delay element in the delay chain formed by delay elements 201 until delay element 201-N, after which the symbol exits the filter. The symbol stored in each of delay elements 201 is multiplied, using a corresponding one of multipliers 203, by a coefficient value. Additionally, the symbol currently being supplied as an output by demodulator 109 is multiplied by a coefficient using multiplier 203-1. The various products produced by multipliers 203 are summed using adders 205 and an output of the FIR filter is supplied from adder 205-N, page 3, paragraph 30).

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Raphaeli with Beck. One would be motivated to combine these teachings because it will provide desired delay to the system which will reduce noise and distortion.

Regarding claim 11, the transceiver has substantially same limitations as claim 3, thus the same rejection is applicable.

Regarding claim 16, the transceiver has substantially same limitations as claim 8, thus the same rejection is applicable.

Regarding claim 19, the transceiver has substantially same limitations as claim 3, thus the same rejection is applicable.

6. Claim 5 – 7, 13 – 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raphaeli (**6466613**) in further view of Shiraishi (**US 6,975,691**) in further view of Webster (**US 2003/0058952**).

Regarding claim 5, Raphaeli with Shiraishi teaches claim 1, however does not disclose that the circuit comprises OFDM transceiver.

Webster further teaches wherein the RF transceiver circuit comprises a portion of an orthogonal frequency division multiplexing (OFDM) transceiver (**i.e. In a particular embodiment, a selected one of Binary Phase Shift Keying (BPSK) and Quadrature Phase Shift Keying (QPSK) is used for modulation of the single-carrier segment and orthogonal frequency division multiplexing (OFDM) is used for modulation of the multi-carrier segment of a mixed carrier signal, page 2, paragraph 10**).

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Raphaeli with Webster. One would be motivated to combine these teachings because OFDM can transmit more data in same bandwidth.

Regarding claim 6, Raphaeli with Shiraishi teaches claim 1, however does not specifically disclose multiplexer.

Webster further teaches wherein outputs from at least a portion of the plurality of filters are delivered as inputs to a multiplexer (**i.e. MUX, 213 of Fig. 2 or 709 of Fig. 7**) that provides the modulated output (**i.e. modulation, page 5, paragraph 40 and page 7, paragraph 52**).

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Raphaeli with Webster. One would be motivated to combine these teachings because multiplexer is easy to implement and cheap.

Regarding claim 7, Webster and Shiraishi teaches claim 1.

Webster further teaches wherein the modulated output is processed by a digital-to-analog (D/A) converter (**i.e. DAC, 215 of Fig. 2**) at a frequency four times greater than a frequency of a carrier of the modulated output (**i.e. frequency to DAC is 44MHz and the input is 11MHz, which is four times greater, Fig. 2**).

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Raphaeli with Webster. One would be motivated to combine these teachings because in doing so it will provide desired output to system.

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Regarding claim 13, the transceiver has substantially same limitations as claim 5, thus the same rejection is applicable.

Regarding claim 14, the transceiver has substantially same limitations as claim 6, thus the same rejection is applicable.

Regarding claim 15, the transceiver has substantially same limitations as claim 7, thus the same rejection is applicable.

Regarding claim 20, the transceiver has substantially same limitations as claim 7, thus the same rejection is applicable.

Allowable Subject Matter

7. Claims 2, 4, 10, 12 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 21 and 22 are allowed since it contains all limitations of claims 1 and objected claim 2. (Method and system).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**.

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See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TANMAY K. SHAH whose telephone number is (571)270-3624. The examiner can normally be reached on Mon-Thu (7:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TANMAY K SHAH/
Examiner, Art Unit 2611

/David C. Payne/

Supervisory Patent Examiner, Art Unit 2611